VII. ECONOMIC IMPACTS

A. INTRODUCTION

This chapter discusses the economic impacts ARB staff anticipates from statewide implementation of the SCM. In general, economic impact analyses are inherently imprecise, especially given the unpredictable behavior of companies in a highly competitive market. While we quantified the economic impacts to the extent feasible, some projections are necessarily qualitative or semi-quantitative and based on general observations about the automotive refinishing industry. This analysis, therefore, serves to provide a general picture of the economic impacts that typical businesses subject to the proposed SCM might encounter; we recognize that individual companies within each district may experience impacts different than those projected in this analysis.

The overall projected impacts are summarized first, followed by a detailed discussion of specific aspects of the economic impacts in the sections listed below:

B) Annual Costs and the Cost-Effectiveness of the Proposed SCM;
C) Economic Impacts on California Businesses;
D) Potential Impacts on California State or Local Agencies; and
E) Potential Impacts on California Consumers.

It is important to note that ARB staff conducted the economic impacts analysis, even though the analysis is not required under the Administrative Procedure Act for a SCM, such as the staff's proposal. The analysis uses virtually the same methodology adopted by the Board in approving the 2000 Architectural Coatings SCM (ARB, 2000) and consumer product rulemakings since 1990 (ARB; 1990; ARB, 1991; ARB, 1997; ARB, 1999).

1. Summary of Economic Impact

Our analysis shows that the cost-effectiveness of the proposed limits is similar to the cost-effectiveness of the existing consumer product regulations (Phase I-II and Mid-Term Measures I-II), as well as other existing ARB regulatory programs. We estimate the overall cost-effectiveness of the proposed SCM to be $1.43 per pound of VOC reduced in current dollars. This cost-effectiveness is comparable in magnitude to that reported for other ARB consumer product regulations and measures, which generally have fallen within a range of no cost to about $6.90 per pound of VOC reduced. The architectural coatings SCM had an average cost-effectiveness of $3.20 per pound of VOC reduced.

In this analysis, we considered the impact to manufacturers of automotive coatings and automotive refinishing facilities. Overall, most automotive refinishing facilities and coatings manufacturers would be able to absorb the cost of the proposed SCM with no

significant adverse impacts on their profitability. This finding is indicated by the staff's estimated change in "return on owner's equity" (ROE) analysis. The analysis found an average decrease in ROE of about 0.07 percent for coating manufacturers, and 15 percent for automotive refinishing facilities. If all costs of the proposed SCM are absorbed by automotive refinishing facilities, the decrease in ROE exceeds the 10 percent threshold typically used to indicate a potential for adverse impacts on profitability. However, we expect the costs incurred by manufacturers and automotive refinishing facilities to be passed on to consumers. If the entire cost of the proposed SCM were passed on to consumers, the average price for a repair would increase by about $11, which represents an increase of about 0.5% for a $2,200 repair. Because we expect most businesses to pass on their costs to consumers, we do not expect a noticeable change in employment; business creation, elimination or expansion; and business competitiveness in California. We also found no significant adverse fiscal impacts on any local or State agencies.

To project the maximum potential impacts on consumers, we assume the opposite scenario relative to the business impacts analysis. That is, rather than determining whether businesses can absorb all costs incurred and not have a significant impact on their profitability, we assume for the consumer impacts analysis that coating manufacturers and automotive refinishing facilities are able to pass on all the costs to the consumers by raising the price of refinishing a vehicle. If the cost were passed on to consumers, most of the impact would probably be in the form of increased insurance premiums. For the purpose of this analysis, we assume that only consumers who have their vehicle repaired or refinished are impacted. With this assumption, we project an average cost increase of about $11 per vehicle repaired or refinished.

2. General Approach for Cost Estimation

The economic impacts analysis consists of several parts. First, we calculated the total annual costs of the proposal. An analysis was conducted to determine the impacts on the annual costs to manufacturers based on raw material costs of typical complying and noncomplying coatings. In addition, we estimated the cost to market and distribute coatings that comply with the limits of the proposed SCM based on discussions with manufacturers. Because the 2002 Survey did not collect data on cleaning solvents, the analysis does not include the potential costs of complying with the proposed VOC limit for solvents. However, solvent manufacturers marketing in the SCAQMD already incurred the costs to develop 25 g/l cleaning solvents because the limit is already in effect the SCAQMD. We then estimated the annual cost to automotive refinishing facilities to use complying coatings without loss of production. The projected annual costs then become the inputs for determining the three main outputs of the analysis: the cost-effectiveness, the business impacts, and the consumer impacts.

The cost-effectiveness is presented to compare the proposal's cost efficiency in reducing a pound of VOC relative to the cost-efficiency of other rules and control measures adopted by the districts and the ARB. The business impact analysis employs two scenarios under which all costs incurred to meet the proposal are absorbed by the

coating manufacturers, and then by assuming that all costs incurred by both the manufacturers and automotive refinishing facilities are absorbed by the automotive refinishing facilities. On the other hand, the consumer impact analysis operates under the hypothetical regime where all costs incurred to meet the proposal are passed on to the consumers in the form of increased cost to refinish a vehicle. These three parts of the analysis represent the boundaries of expected impacts, with the actual regulatory impacts from the proposal probably falling somewhere between these three extremes (i.e., some costs are absorbed by the manufacturer, some costs are absorbed by the automotive refinishing facilities, with the remaining costs passed on to consumers). Thus, the actual business impacts and price increases will likely be less than predicted in this analysis.

Distributors of automotive coatings may also incur some costs if those costs cannot be passed on to the automotive refinishing facilities because of competitive pressures. Potential cost to these operations might include some cost sharing between the manufacturer and distributor to transition customers to new products such as water-borne color coats. Based on discussions with industry representatives, it appears that cost sharing arrangements can vary widely and are not available to all automotive refinishing facilities. Thus, staff is unable to assess the potential impacts to distributors. However, because all coating and solvent manufacturers are subject to the same VOC limits, any impacts to distributors should be similar regardless of what manufacturer's products they market.

3. Sources and Treatment of Cost Data

The cost analysis relied on various sources of information. For cost information specific to manufacturers, we relied on estimates based on discussions with manufacturers of automotive coatings. Most manufacturers already market coatings that would comply with the limits in the SCM, and the estimated cost was primarily based on the cost for all manufacturers to market and distribute those coatings in California (Taylor, 2005). Compliant cleaning solvents are also currently marketed in California.

For industry wide data on automotive refinishing facilities, we relied on the U.S. Census Bureau, industry organizations, the SCAQMD, and information from third party sources. To estimate the cost of equipment, training, and other services automotive refinishing facilities may need to comply with the SCM and maintain sufficient levels of production, we relied on discussions with distributors of automotive coatings, spray booth manufacturers, air movement manufacturers, and automotive refinishing facility operators (US Census, 2005; Henderson, 2005; SCAQMD, 2005; Taylor, 2005; Elders, 2005; Ortiz, 2005; Hagan, 2005; Mac, 2005; Phillips, 2005).

We assumed that operating and maintenance costs for new equipment and waste disposal for water-borne color coatings is five percent of the equipment costs.

B. ANNUAL COSTS AND THE COST-EFFECTIVENESS (C.E.) OF THE PROPOSED SCM

1. Introduction

In the following analysis, we present the anticipated annual costs and cost-effectiveness of the proposed SCM. Determining the proposal's cost-effectiveness allows us to compare the efficiency of the proposed SCM in reducing a pound of VOC relative to other existing regulatory programs. To do this, we applied a well-established methodology for converting compliance costs, both nonrecurring and recurring costs, to an annual basis. We then report the ratio of the annual costs to the annual emission reductions in terms of "dollars (to be) spent per pound of VOC reduced." To put the proposal's cost-effectiveness into proper perspective, we compare the results of our analysis with the cost-effectiveness of other ARB regulations and control measures.

2. Methodology

As noted previously, the cost-effectiveness of a regulation is generally defined as the ratio of total dollars to be spent to comply with the regulation (as an annual cost) to the mass reduction of the pollutant(s) to be achieved by complying with that regulation (in annual pounds). Annual costs include annualized nonrecurring costs (e.g., total research and development (R&D), product and consumer testing, equipment purchases/modifications, one-time distributional/marketing changes, etc.) and annual recurring costs (e.g., increases or decreases in raw material costs, labeling, packaging, recordkeeping & reporting, etc.). Thus, the cost-effectiveness is calculated according to the following general equations:

$$\text{Cost-Effectiveness} = \frac{\text{Annualized Nonrecurring Costs} + \text{Annual Recurring Costs}}{\text{Annual Emission reductions}}$$

where,

Annualized Nonrecurring Costs = CRF x ∑ (Nonrecurring Costs)
Annual Recurring Costs = Raw Material Costs + Non Raw Material Costs

The CRF is calculated as follows:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where,

CRF = Capital Recovery Factor
I = discount interest rate in real terms (assumed to be four percent)
n = project horizon or useful life of equipment

As shown above, we annualized the nonrecurring costs (i.e., one-time fixed costs such as R&D, equipment purchases, etc.) using the Capital Recovery Method, which is the recommended approach under California Environmental Protection Agency (Cal/EPA) guidelines. Using this method, we multiply the estimated total fixed costs to comply with each proposed limit by the Capital Recovery Factor (CRF) to convert these fixed costs into discounted, equal annual payments in current dollars over the selected project horizon (i.e., the projected useful life of the investment) (Cal/EPA, 1996). We then sum the annualized fixed costs with the annual recurring costs and divide that sum by the annual emission reductions to calculate the cost-effectiveness of each limit.

3. Assumptions

There are a number of assumptions made to determine the impact to automotive refinishing facilities. Due to the number and unique needs of automotive refinishing facilities in California, some of these businesses will incur costs which will be different than what we have estimated in this analysis.

In determining the impact to automotive refinishing facilities as a worst case scenario, staff assumed that every facility will need to apply water-borne color coatings. Compliant color coatings may be developed with exempt solvents that would require little modification to existing equipment in automotive refinishing facilities. There are also some automotive refinishing facilities that only use single stage coatings which we expect to remain solvent-borne. We don't expect these facilities to be impacted by the SCM.

Coating manufacturers recommend additional air movement equipment to dry water-borne color coatings quickly. Heating equipment was suggested as an option that would allow automotive refinishing facilities to improve production levels. There are a number of solutions available to automotive refinishing facilities to meet air movement needs. These range from small hand held devices to fully integrated air movement systems. Although each automotive refinishing facility will evaluate the costs and benefits of air movement systems, we assumed that automotive refinishing facilities with high annual revenues will generally install the more expensive upgrades to their spray booths to maintain current production levels. We also assumed that automotive refinishing facilities with low annual revenues will install less expensive equipment to save on overall cost. The specific assumptions are discussed in Appendix C.

ARB staff estimated there are about 4,100 automotive refinishing facilities in California. Staff estimated the average gross annual revenue for an automotive refinishing facility to be about one million dollars (Taylor, 2005).

We assumed that 57 percent of all automotive refinishing facilities have a single spray booth. In the absence of industry wide statistics on the number of spray booths for automotive refinishing facilities in California, we used data from the SCAQMD to estimate the number of facilities with multiple booths (SCAQMD, 2005). Although there may be facilities in all revenue categories that have a single spray booth, staff assumed

that only automotive refinishing facilities with annual revenue of less than one million dollars have a single spray booth. We also assumed that 25 percent of the booths have heating equipment, based on data from the SCAQMD. We assumed that all facilities with greater than $2.5 million annual revenue have heating equipment, and all facilities with less than one million dollars annual revenue have no heating equipment.

ARB staff conducted an analysis of raw material costs to manufacturers based on typical ingredients found in complying and noncomplying coatings. Staff determined that the raw material costs of products that comply with the limits of the proposed SCM are generally less than the raw material costs of products that do not comply with the proposed SCM. To be conservative, staff assumed there would be no cost savings to manufacturers or to automotive refinishing facilities from raw material prices.

We also assumed that some small coating manufacturers would cease to sell products in California. According to the 2002 Automotive Coatings Survey, there were 17 manufacturers that sold automotive coatings in California in 2001. Ten of these manufacturers account for about 98 percent of the total volume of automotive coatings sold in California in 2001. We assume that the remaining seven manufacturers that sell very low volumes of coatings in California will cease to sell their products here due to the cost of complying with the SCM.

We also assumed a project horizon of five years and a real discount rate of four percent throughout the project horizon. The five year project horizon is appropriate because that is the generally accepted project horizon used in cost analyses involving chemical processing industries. In addition, five years is the number of years for a project horizon generally recommended by Cal/EPA when conducting a cost-effectiveness analysis (Cal/EPA, 1996, *supra*). With regard to the discount rate, Cal/EPA recommends two percent plus the current yield for a U.S. Treasury note of similar maturity to the project horizon (*Id.*), which in recent years has been about four percent (CNN, 2005). We also assumed a two percent inflation rate.

4. Results

The cost-effectiveness of the SCM is estimated to be $1.43 per pound of VOC reduced, which compares favorably with the cost-effectiveness of measures such as the 2000 Architectural Coatings SCM ($3.20 per pound of VOC reduced). The average annual cost to automotive coating and solvent manufacturers is estimated to be about $320,000. The average annual cost to automotive refinishing facilities is estimated to be about $3,400. The total annualized cost to comply with the proposed SCM is estimated to be about $14 million.

C. ECONOMIC IMPACTS ON CALIFORNIA BUSINESSES

1. Legal Requirements

ARB staff conducted an economic impacts assessment although it is not legally required for the proposed SCM. Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete with businesses in other states. Because the staff's proposal is a SCM rather than an administrative regulation, the business impacts assessment is not required. However, ARB staff conducted the normally required business impacts assessment to provide the Board and districts a comprehensive evaluation of the potential cost impacts. Similarly, we also evaluated the SCM's potential impacts to State and local agencies. Normally, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any nondiscretionary cost or savings to local agencies and the cost or savings in federal funding to the State. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year.

2. Potential Impact on California Businesses

Only one company, Ellis Paint, currently manufactures automotive coatings in the State. The impact on this company is expected to be minimal since they have coatings that meet the proposed limits in most categories. Additionally, Ellis Paint does not produce color coatings, which will require the most reformulation under the proposed SCM. Ellis Paint also manufactures cleaning solvents that meet the proposed VOC limit of 25 g/l.

3. Affected Businesses

Any person that uses, supplies, sells, offers for sale, manufactures, distributes, blends, or repackages for sale automotive coatings or associated solvents or performs automotive refinishing would potentially be affected by the proposed SCM. Also, potentially affected are businesses that manufacture air movement or heating equipment for spray booths; or supply resins, exempt solvents, or other ingredients and equipment to these manufacturers or marketers.

The focus of this analysis, however, will be on coating manufacturers and automotive refinishing facilities because these businesses would be directly affected by the proposed SCM. Distributors of automotive coatings may also incur some cost if those costs cannot be passed on to the automotive refinishing facilities because of competitive pressures. However, ARB staff is unable to quantify these impacts. Potential costs to distributors might include some cost sharing between the

manufacturer and distributor to transition automotive refinishing facilities to new products such as water-borne color coatings. Staff does not have data on the extent to which such cost sharing might occur.

Automotive coatings are manufactured or marketed by 17 companies nationwide, of which one is based in California, according to the 2002 Survey. The bulk of the sales volume in California was generated by a few companies; three manufacturers account for 65 percent of the volume, with the remaining 14 companies accounting for the other 35 percent (ARB, 2005). The automotive coating manufacturers marketed about 3.7 million gallons of coatings in California in 2001, of which an estimated one million gallons were compliant and 2.7 million gallons were noncompliant with the proposed SCM (*Id.*).

Staff estimates there are approximately 4,100 automotive refinishing facilities in California. These businesses generated about $2.4 billion in annual revenue in 1997 (U.S. Census, 2005). About half of these facilities have an annual revenue of less than $500,000 per year (Taylor, 2005).

a. Study Approach

Sixteen of the 17 manufacturers of automotive coatings who responded to ARB's 2002 Survey sold coatings in California in 2001 that did not meet the proposed SCM limits. Staff did not have information on the 17th manufacturer to make this determination. In addition, for purposes of determining worse-case potential economic impact, staff assumes that all automotive refinishing facilities in California will need to incur costs to comply with the proposed SCM. This is a conservative estimate because facilities that use only single-stage color coatings would not need to invest in air movement equipment or heat because they would continue to use currently available, compliant solvent-borne coatings. The approach used in evaluating the potential economic impact of the proposed SCM on these businesses is outlined as follows:

1) Compliance cost was estimated for manufacturers and automotive refinishing facilities;
2) Estimated cost was adjusted for federal and State taxes; and
3) The three-year average ROE was calculated for businesses by averaging the median ROEs for 2002 through 2004. Actual financial data were used for coating manufacturers where such data were available publicly. In case of the automotive refinishing facilities, however, actual financial data were not available publicly. Thus, we developed a financial profile of a typical California automotive refinishing facility with an annual revenue of $1 million using the Dun and Bradstreet financial ratios for the industry.

ROE is calculated by dividing the net profit by the net worth. The adjusted cost was then subtracted from the net profit data. The results were used to calculate an adjusted three-year average ROE. The adjusted ROE was then compared with the ROE before the subtraction of the adjusted cost to determine the potential impact on the profitability

of the businesses. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts.

The threshold value of 10 percent has been used consistently by the ARB staff to determine impact severity (ARB, 1990; ARB, 1991; ARB, 1995; ARB, 1998). This threshold is consistent with the thresholds used by the U.S. EPA and others.

b. Assumptions

The ROEs before and after the subtraction of the adjusted compliance costs were calculated for a typical business using financial data for 2002 through 2004. The calculations were based on the following assumptions:

1) Selected businesses are representative of affected businesses;
2) All affected businesses were subject to the highest federal and State corporate tax rates of 35 percent and 9.3 percent respectively; and
3) Affected businesses are not able to increase the prices of their products, nor can they lower their costs of doing business through short-term cost-cutting measures.

Given the limitation of available data, staff believes these assumptions are reasonable for most businesses at least in the short run. However, they may not be applicable to all businesses.

c. Results

Table VII-1 shows the estimated change in ROE on affected industry groups.

Table VII-1 Changes in Return on Owner's Equity (ROE) for Typical Businesses in the Automotive Refinishing Industry

SIC Code and Category	Change in ROE
2851 Manufacturing - Paints, Varnishes, Lacquers, Enamels, And Allied Products	0.07 percent
7532 Automotive Repair - Top, Body, and Upholstery Repair facilities and Paint facilities	15 percent

The estimated average decline in profitability of businesses is about 0.07 percent for manufacturers, and about 15 percent for automotive refinishing facilities. If the automotive refinishing facilities absorbed all costs, they would be adversely impacted by the proposed SCM. However, we expect automotive refinishing facilities to pass on the costs of the proposed SCM to consumers. If the entire cost of the proposed SCM were passed on to consumers, the average price for a repair or refinish would increase by about $11, which represents an increase of about 0.5% for a $2,200 repair.

The performance of businesses may differ from year to year. Hence, the average financial data used may not be representative of an average year performance for some businesses. The estimated changes to ROEs may be high because affected

businesses probably would not absorb all of the increase in their costs of doing business. They might be able to either pass some of the cost on to consumers in the form of higher prices, reduce their costs, or do both.

4. Potential Impact on Employment

The paint or body repair facilities (NAICS 811121/SIC 7532) are defined as establishments engaged in repairing or customizing automotive vehicles, such as passenger cars, trucks, and vans, and all trailer bodies and interiors; and/or painting automotive vehicles and trailer bodies. It is estimated that there are 27,665 paid employees involved in the automotive body repair and refinishing services (U.S. Census, 2005).

We expect the proposed SCM to have minimal impact on most employees that do automotive refinishing. While it is possible that some automotive refinishing facilities may experience higher costs than those estimated above, we believe that most will not be impacted adversely if districts adopt the proposed SCM.

Cost impacts on coating manufacturers will be minimal. Most coating manufacturers are global companies and the proposed SCM would have minimal impact on their operations as indicated by the change in ROE. Thus, we do not expect any significant impact in the employment at these companies.

5. Potential Impact on Business Creation, Elimination, or Expansion

The proposed SCM should have no noticeable impact on the status of California businesses. This is because the costs are not expected to impose a significant impact on the profitability of businesses in California. However, some small automotive refinishing facilities with little or no margin of profitability may lack the financial resources to modify their facilities in a timely manner. Should the proposed measures impose a significant hardship on these businesses, temporary relief in the form of a compliance date extension under the local districts' variance provision may be warranted.

While some individual businesses may be affected adversely, the proposed SCM may provide business opportunities for existing California businesses or result in the creation of new businesses. California businesses that produce air movement equipment for spray booths or provide consulting services to affected businesses may benefit from increased industry spending.

6. Potential Impact on Business Competitiveness

The proposed SCM is not expected to have a significant impact on the ability of automotive refinishing facilities in California to compete with businesses from another state. Most automotive refinishing facilities are independent operations that compete for local business within their region and rarely seek business from outside the State.

The proposed SCM should have no significant impact on the ability of California manufacturers of automotive coatings to compete with businesses in other states. Because the proposed measures would apply to all businesses that manufacture or market automotive coatings for sale in California regardless of their location, the staff's proposal should not present any economic disadvantages specific to California businesses. Of the 17 companies involved in manufacturing or marketing of automotive coatings in California, only one company is located in California.

D. POTENTIAL IMPACTS ON CALIFORNIA STATE OR LOCAL AGENCIES

We have identified no State or local agency that would be adversely affected by the proposed SCM. One State agency, the California Department of Transportation, performs touch-up work on their fleet vehicles with single-stage color coatings. Since many single-stage color mixtures already comply with the limits of the proposed SCM, we do not expect them to be adversely affected. Additionally, we expect single-stage color coatings to remain solvent-borne, thus there would not be a need for air movement equipment. There are cleaning solvents already available that meet the proposed VOC limit in the SCM. Thus, the solvent requirement is not expected to have an adverse impact on State or local agencies.

E. POTENTIAL IMPACTS ON CALIFORNIA CONSUMERS

The potential impact of the SCM on consumers depends upon the extent to which affected businesses are able to pass on the increased cost to consumers in terms of higher prices for their services. Given the small impact of the proposed SCM on the profitability of most automotive refinishing facilities, we do not expect a noticeable change in the price of services provided by these businesses. Since most repairs are paid directly by insurance companies, consumers may be impacted by higher insurance premiums. We anticipate the impact, if any, on consumers to be negligible. If the annual cost of the proposed SCM were divided among the total number of repairs in California per year, the average cost of a repair would increase by about $11. This represents a 0.5% increase in cost for a typical repair of $2,200. If the consumer is paying for the refinishing directly, he or she would have to absorb the entire cost.

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